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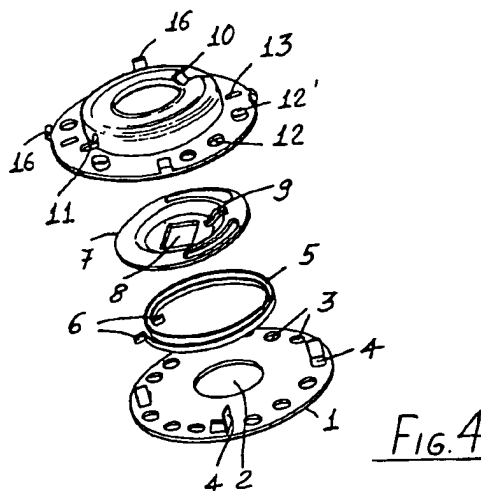
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⑤④ **Washer for spring latch lock handles, including a return spring.**

⑤⑦ A washer for spring latch lock handles comprises a disc 1 having a central hole 2 and a plurality of perimetrical holes 3 supporting a steel spring 5 having outwardly and inwardly bent end portions 6,8, the spring cooperating with a disc-like restraining element 7 at the center of which there is provided a square hole 8 having a cross-section mating with that of the pin affixed in the hub of the handle, the spring 5 and the disc-like element 9 being restrained, on the first mentioned disc 1, by an annular element 10 having a central raised portion.



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## BACKGROUND OF THE INVENTION

The present invention relates to a washer for spring latch lock handles, including a return spring.

As is known, the handles operating spring latch locks are conventionally provided with a flexure coil spring, which is urged so as to cause the lock handle to return to its starting position upon operating the lock.

Also known is that a proper arrangement of the above mentioned return spring can cause great operating difficulties mainly during the assembling operation of the handle.

Further practical difficulties can arise, moreover, from the requirement of conveniently preloading the spring.

## SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks, by providing a washer for spring latch lock handles directly including a spring resiliently restraining the rotary movement of the handle.

Within the scope of the above mentioned aim, a main object of the present invention is to provide such a washer for spring latch lock handles which is very simple construction-wise and very reliable in operation.

Another object of the present invention is to provide such a washer which can be used both for clockwise rotary handles and for anti-clockwise rotary handles, that is adapted to be indifferently assembled either as a so-called right washer or a so-called left washer.

According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a washer for spring latch lock handles characterized in that said washer comprises a disc member including a central hole and a plurality of perimetrical holes, said disc member coaxially supporting thereon a steel spring, said steel spring having one end thereof outwardly bent and another end thereof inwardly bent, said spring cooperating with a restraining disc-like element at a central portion whereof there is formed a square hole mating with pin means associated with hub means included in a said handle.

In particular, the spring and disc-like element are restrained on the disc member by a restraining annular structure having a central raised portion.

## BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the washer for spring latch lock handles according to the present invention will become more apparent herein-

after from the following detailed disclosure of a preferred, though not exclusive, embodiment thereof, which is illustrated, by way of an indicative but not limitative example, in the figures of the accompanying drawings, where:

Figure 1 illustrates a pair of washers, according to the invention, restrained on two sides of a door, by different restraining or anchoring means;

Figure 2 is a cross-sectional view of a washer according to the invention which is directly engaged in a housing provided in the hub of the lock handle;

Figure 3 is a cross-sectional view illustrating a washer provided with a crowned screw cover, and Figure 4 is an exploded view of the washer according to the invention.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures of the accompanying drawings, the washer for spring latch lock handles according to the invention comprises a disc member 1 including a central hole 2 and a plurality of perimetrical holes 3, as well as a plurality of perimetrical tongues 4.

On the disc member there is supported a coil spring 5 provided with end portions 6 one of which is outwardly bent and the other of which is inwardly bent, so as to not interfere against the adjoining coil turn.

Above the mentioned coil, there is located a disc-like element 7 having a recessed central portion including a square cross-section hole 8.

This recessed central portion is provided with a perimetrical cut-out 9, therein there is engaged the radially bent inner end portion of the above mentioned spring.

On the assembly formed by the spring and disc-like element there is mounted an annular structure 10 which, in turn, is provided with a raised central portion on the perimeter of which there is formed an opening 11 for restraining the outer end portion of the spring.

The mentioned annular structure is moreover provided with a plurality of perimetrical holes 12 some of which, indicated at 12', have a raised and threaded edge, and a plurality of perimetrical slots 13 therein can be engaged the tongues 4 of the disc member 1 which tongues will be successively bent on said structure.

Thus, there is obtained a cage construction, restraining the several mentioned elements and provided to be affixed on one of the faces or sides of the door 14, coaxially with respect to the hole receiving the square steel element 15 for operating the lock.

It should be moreover pointed out that on the edge portion of said annular structure 10 there are provided a plurality of upwardly extending lugs 16 having doubly bent end portions, so as to define an

outer convex surface of resilient nature.

These lugs, in particular, will resiliently restrain a screw covering washer 17 which can be provided either with a flat surface (Figure 1) or with a crowned surface (Figure 3).

In particular, between the hub 18 of the handle and the mentioned cage construction there is interposed an anti-friction washer 19 also adapted to operate as a spacer element.

Said cage construction, holding the mentioned mechanism, can be affixed to the door by means of throughgoing screws 20 engaging in the threaded portions formed through the annular structure of a cage arranged on the opposite side of the door or, also, by screws 21 directly engaging in the door material.

Figure 2, in particular, shows a hub member which has been so machined as to directly cover the mentioned holding cage.

In this connection it should be apparent that, by suitably changing the assembling procedure of the several components, it will be possible to provide an operating device adapted to operate both clockwise and anti-clockwise rotary handles.

Moreover, the constructional features of the spring included in the washer according to the invention, will allow the washer to be used on any types of door, included the so-called anti-flame doors.

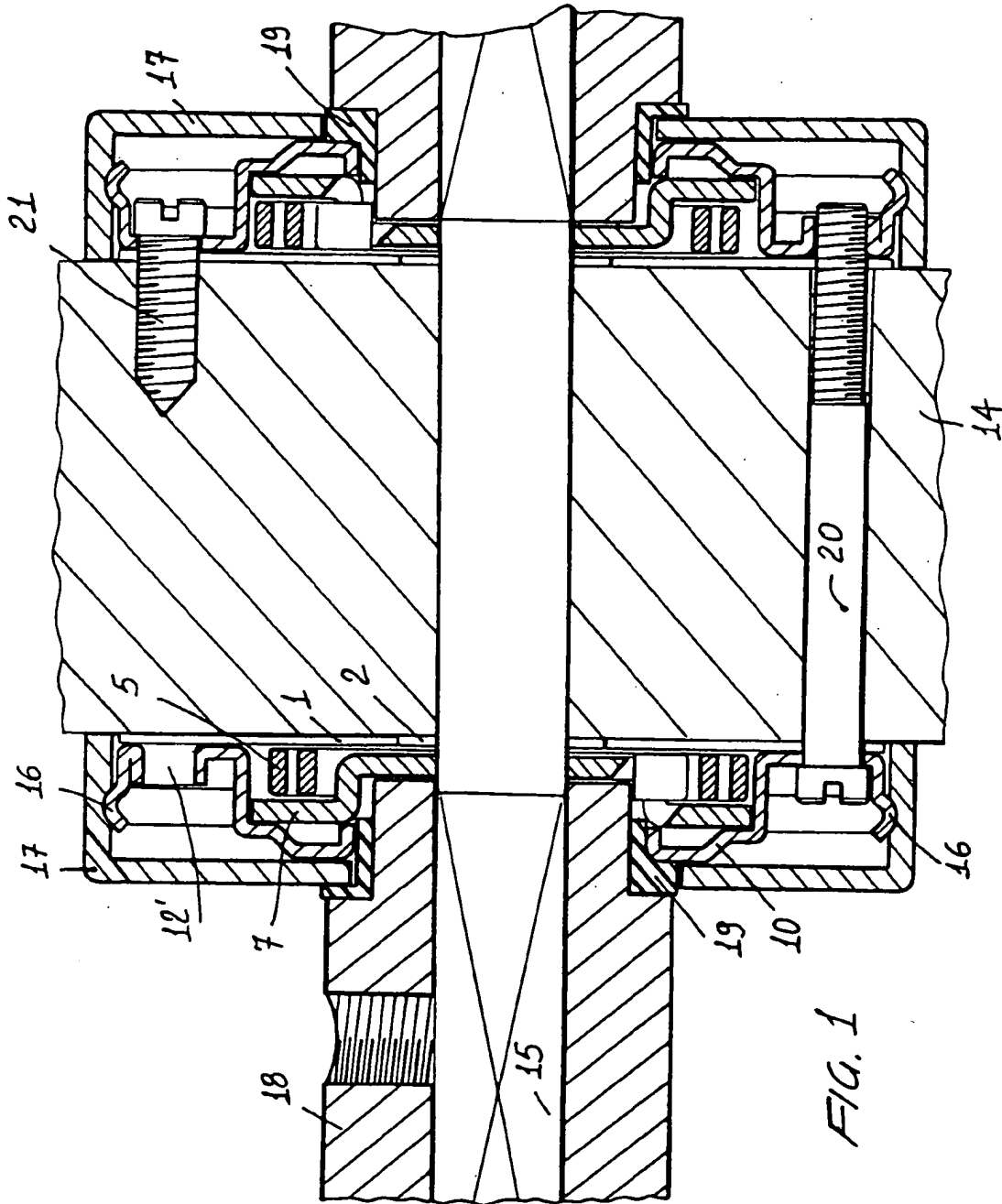
While the invention has been disclosed and illustrated with reference to a preferred embodiment thereof, it should be apparent that the disclosed embodiment is susceptible to several modifications and variations, all of which will come within the spirit and scope of the appended claims.

#### Claims

1. A washer for spring latch lock handles, characterized in that said washer comprises a disc member including a central hole and a plurality of perimetrical holes, said disc member coaxially supporting thereon a coil spring, said coil spring having one end thereof outwardly bent and another end thereof inwardly bent, said spring cooperating with a restraining disc-like element at a central portion whereof there is formed a square hole mating with pin means associated with hub means included in a said handle.
2. A washer according to Claim 1, wherein said spring and disc-like element are restrained on said disc member by an annular structure having a raised central portion.
3. A washer according to Claim 1, wherein said disc member is provided with a plurality of perimetrical tongues, end portions of said spring being so

bent as to not interfere against an adjoining turn of said coil spring.

4. A washer according to Claim 1, wherein said disc-like element is provided with a central recessed portion including a perimetrical cut-out therein there is engaged a radially bent inner portion of said spring.
5. A washer according to Claim 1, wherein said central raised portion of said annular structure is provided with a perimetrical opening restraining the outer end portion of said coil spring.
6. A washer according to Claim 1, wherein said annular structure is also provided with a plurality of perimetrical holes, some of said perimetrical holes having raised and threaded edge portions, said annular structure further including a plurality of perimetrical slots therein can be engaged said tongues of said disc member.
7. A washer according to Claim 1, wherein said annular structure further comprises upwardly extending lugs having doubly bent end portions providing a flexible convex outer surface.
8. A washer according to Claim 7, wherein said lugs are adapted to resiliently restrain a screw covering washer including either a flat or a crowned surface.



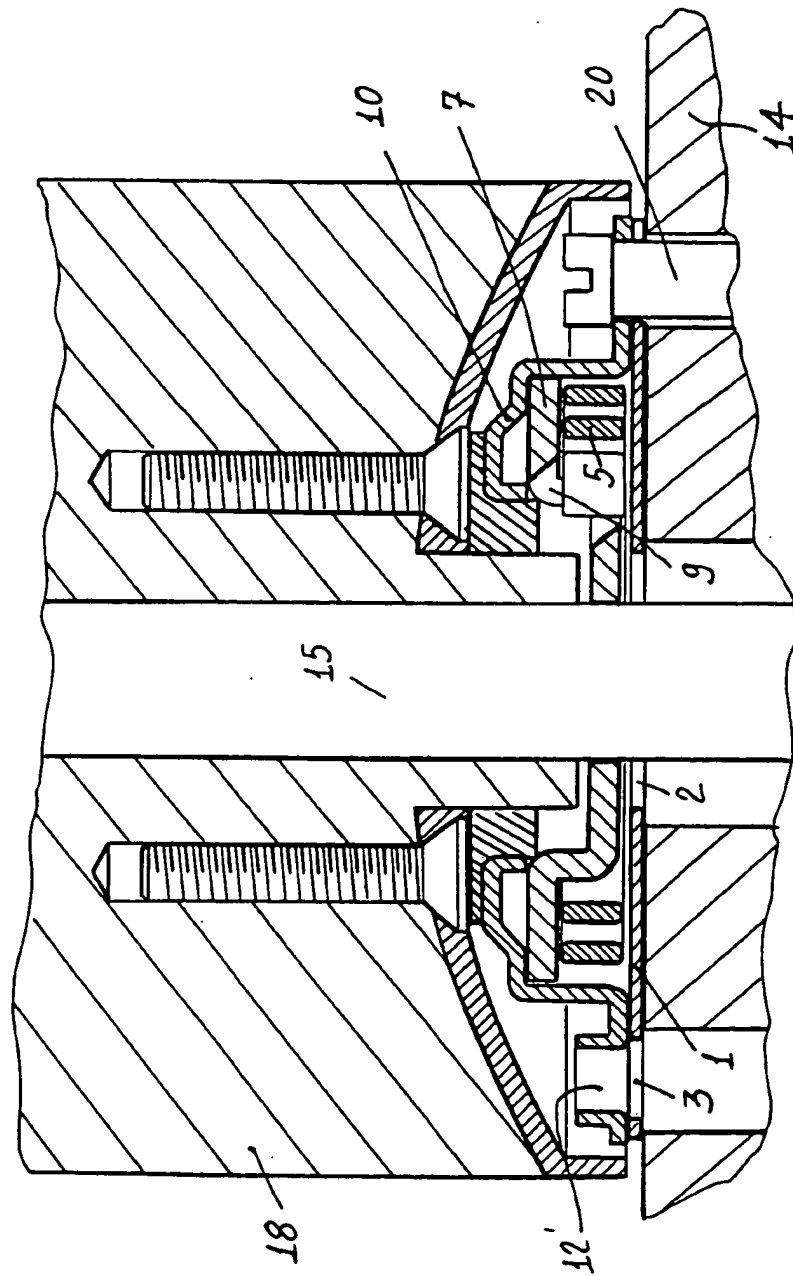


Fig. 2

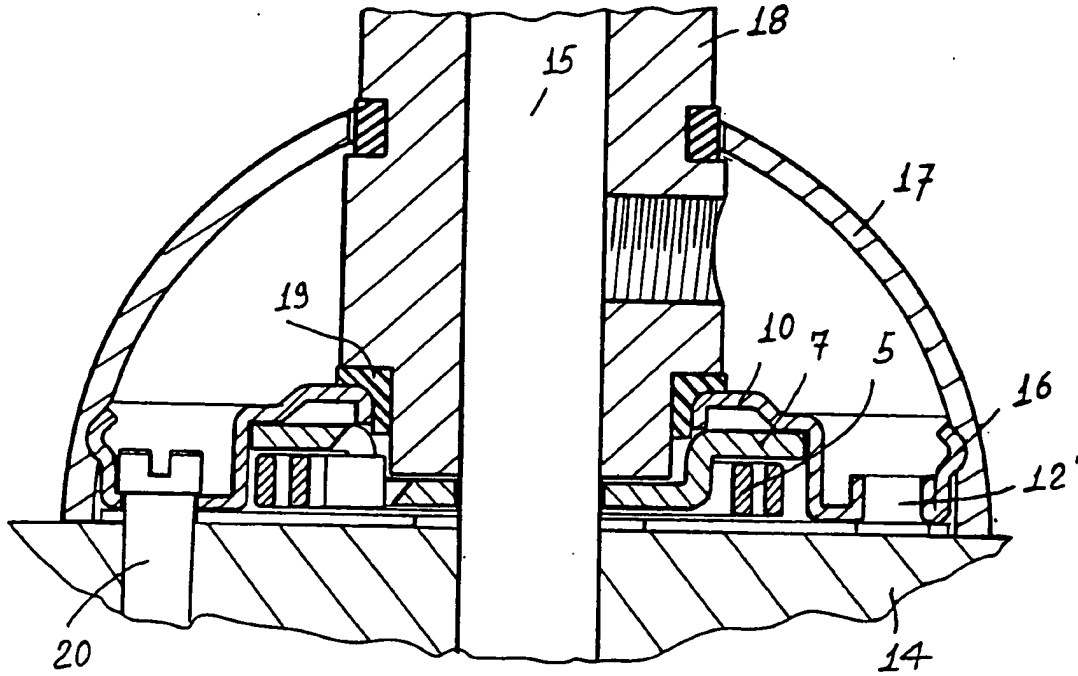


FIG. 3

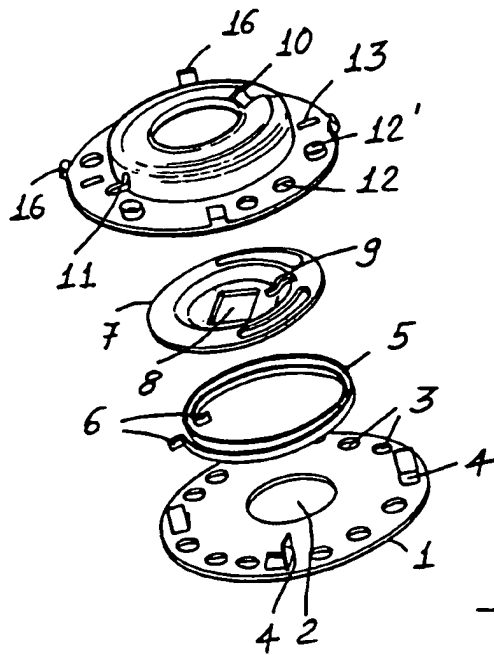


FIG. 4



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number

EP 92 83 0019

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. CLS)
X	GB-A-2 173 539 (A.B.T. HARDWARE LIMITED)	1,2,5,7,8	E05B3/06
A	* the whole document *	6	
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X	FR-A-1 236 000 (ETABLISSEMENTS MOREAU FRERES ET SOCIETE LIOX)	1-3	
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X	GB-A-575 203 (EVERED & COMPANY LIMITED)	1,2,4,5	
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A	GB-A-2 095 788 (THE SHEFFIELD BRICK GROUP LIMITED)	1,2,6	
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X	FR-A-2 650 322 (ETS H. BOUVET)	1,3,4	
	* the whole document *		
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			TECHNICAL FIELDS SEARCHED (Int. CLS)
			E05B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13 NOVEMBER 1992	Examiner VESTIN K.
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